

**Amendments to the Claims:**

The following lists all claims and their status:

1-4187. (cancelled)

4188. (currently amended): A mixture produced from ~~a portion of~~ a hydrocarbon containing formation, ~~the mixture~~, comprising:

a non-condensable component~~hydrocarbons~~ comprising hydrocarbons having carbon numbers of less than 5; and

wherein a weight ratio of the hydrocarbons having carbon numbers from 2 through 4, ~~to methane, to methane~~ in the non-condensable component ~~mixture~~ is greater than approximately 1.

4189. (previously presented): The mixture of claim 4188, further comprising condensable hydrocarbons, wherein about 0.1 % by weight to about 15 % by weight of the condensable hydrocarbons are olefins.

4190. (currently amended): The mixture of claim 4188, wherein a molar ratio of ethene to ethane in the non-condensable ~~hydrocarbons~~ component ranges from about 0.001 to about 0.15.

4191. (previously presented): The mixture of claim 4188, further comprising condensable hydrocarbons, wherein less than about 1 % by weight, when calculated on an atomic basis, of the condensable hydrocarbons is nitrogen.

4192. (previously presented): The mixture of claim 4188, further comprising condensable hydrocarbons, wherein less than about 1 % by weight, when calculated on an atomic basis, of the condensable hydrocarbons is oxygen.

4193. (previously presented): The mixture of claim 4188, further comprising condensable hydrocarbons, wherein about 5 % by weight to about 30 % by weight of the condensable hydrocarbons comprise oxygen containing compounds, and wherein the oxygen containing compounds comprise phenols.

4194. (previously presented): The mixture of claim 4188, further comprising condensable hydrocarbons, wherein less than about 1 % by weight, when calculated on an atomic basis, of the condensable hydrocarbons is sulfur.

4195. (previously presented): The mixture of claim 4188, further comprising condensable hydrocarbons, wherein greater than about 20 % by weight of the condensable hydrocarbons are aromatic compounds.

4196. (previously presented): The mixture of claim 4188, further comprising condensable hydrocarbons, wherein less than about 5 % by weight of the condensable hydrocarbons comprises multi-ring aromatics with more than two rings.

4197. (previously presented): The mixture of claim 4188, further comprising condensable hydrocarbons, wherein less than about 0.3 % by weight of the condensable hydrocarbons are asphaltenes.

4198. (previously presented): The mixture of claim 4188, further comprising condensable hydrocarbons, wherein about 5 % by weight to about 30 % by weight of the condensable hydrocarbons comprise cycloalkanes.

4199. (currently amended): The mixture of claim 4188, wherein the non-condensable ~~hydrocarbons component further comprises~~ molecular hydrogen, wherein the molecular hydrogen is greater than about 10 % by volume of the non-condensable ~~hydrocarbons component~~ at 25 °C and 1 atmosphere absolute pressure, and wherein the molecular hydrogen is less than about 80 %

by volume of the non-condensable ~~hydrocarbons~~ component at 25 °C and 1 atmosphere absolute pressure.

4200. (currently amended): The mixture of claim 4188, further comprising ammonia, wherein greater than about 0.05 % by weight of the ~~produced~~ mixture is ammonia.

4201. (previously presented): The mixture of claim 4188, further comprising ammonia, wherein the ammonia is used to produce fertilizer.

4202. (previously presented): The mixture of claim 4188, further comprising condensable hydrocarbons, wherein less than about 15 weight % of the condensable hydrocarbons have a carbon number greater than approximately 25.

4203. (previously presented): The mixture of claim 4188, further comprising condensable hydrocarbons, wherein the condensable hydrocarbons comprise olefins, and wherein about 0.1 % to about 5 % by weight of the condensable hydrocarbons comprises olefins.

4204. (currently amended): The mixture of claim 4188, further comprising condensable hydrocarbons, wherein the condensable hydrocarbons ~~comprises~~ comprise olefins, and wherein about 0.1 % to about 2.5 % by weight of the condensable hydrocarbons comprises olefins.

4205. (previously presented): The mixture of claim 4188, further comprising condensable hydrocarbons, wherein the condensable hydrocarbons comprise oxygenated hydrocarbons, and wherein greater than about 5 % by weight of the condensable hydrocarbons comprises oxygenated hydrocarbons.

4206. (currently amended): The mixture of claim 4188, ~~further comprising non-condensable hydrocarbons,~~ wherein the non-condensable ~~hydrocarbons~~ component ~~comprise~~ comprises H<sub>2</sub>, and wherein greater than about 5 % by weight of the non-condensable ~~hydrocarbons~~ component comprises H<sub>2</sub>.

4207. (currently amended): The mixture of claim 4188, ~~further comprising non-condensable hydrocarbons, wherein the non-condensable hydrocarbons component comprise comprises~~ H<sub>2</sub>, and wherein greater than about 15 % by weight of the non-condensable ~~hydrocarbons component~~ comprises H<sub>2</sub>.

4208. (currently amended): The mixture of claim 4188, wherein a weight ratio of hydrocarbons having greater than about 2 carbon atoms, ~~to methane,~~ to methane is greater than about 0.3.

4209. (currently amended): A mixture produced from ~~a portion of a~~ hydrocarbon containing formation, ~~the mixture comprising:~~

a non-condensable hydrocarbons component comprising hydrocarbons having carbon numbers of less than 5, wherein a weight ratio of hydrocarbons having carbon numbers from 2 through 4, ~~to methane,~~ to methane is greater than approximately 1; and

condensable hydrocarbons comprising oxygenated hydrocarbons, wherein greater than about 5 % by weight of the condensable ~~component~~ hydrocarbons comprises oxygenated hydrocarbons.

4210. (original): The mixture of claim 4209, wherein about 0.1 % by weight to about 15 % by weight of the condensable hydrocarbons are olefins.

4211. (currently amended): The mixture of claim 4209, wherein a molar ratio of ethene to ethane in the non-condensable ~~hydrocarbons component~~ ranges from about 0.001 to about 0.15.

4212. (original): The mixture of claim 4209, wherein less than about 1 % by weight, when calculated on an atomic basis, of the condensable hydrocarbons is nitrogen.

4213. (original): The mixture of claim 4209, wherein less than about 1 % by weight, when calculated on an atomic basis, of the condensable hydrocarbons is oxygen.

4214. (original): The mixture of claim 4209, wherein less than about 1 % by weight, when calculated on an atomic basis, of the condensable hydrocarbons is sulfur.

4215. (original): The mixture of claim 4209, wherein about 5 % by weight to about 30 % by weight of the condensable hydrocarbons comprise oxygen containing compounds, and wherein the oxygen containing compounds comprise phenols.

4216. (original): The mixture of claim 4209, wherein greater than about 20 % by weight of the condensable hydrocarbons are aromatic compounds.

4217. (original): The mixture of claim 4209, wherein less than about 5 % by weight of the condensable hydrocarbons comprises multi-ring aromatics with more than two rings.

4218. (original): The mixture of claim 4209, wherein less than about 0.3 % by weight of the condensable hydrocarbons are asphaltenes.

4219. (original): The mixture of claim 4209, wherein about 5 % by weight to about 30 % by weight of the condensable hydrocarbons are cycloalkanes.

4220. (currently amended): The mixture of claim 4209, wherein the non-condensable ~~hydrocarbons component~~ comprises molecular hydrogen, wherein the molecular hydrogen is greater than about 10 % by volume of the non-condensable ~~hydrocarbons component~~ at 25 °C and one atmosphere absolute pressure, and wherein the molecular hydrogen is less than about 80 % by volume of the non-condensable ~~hydrocarbons component~~ at 25 °C and one atmosphere absolute pressure.

4221. (currently amended): The mixture of claim 4209, wherein the ~~produced~~-mixture comprises ammonia, and wherein greater than about 0.05 % by weight of the ~~produced~~-mixture is ammonia.

4222. (currently amended): The mixture of claim 4209, wherein the ~~produced~~ mixture comprises ammonia, and wherein the ammonia is used to produce fertilizer.

4223. (original): The mixture of claim 4209, wherein less than about 5 weight % of the condensable hydrocarbons in the mixture have a carbon number greater than approximately 25.

4224. (original): The mixture of claim 4209, wherein the condensable hydrocarbons further comprise olefins, and wherein about 0.1 % to about 5 % by weight of the condensable hydrocarbons comprises olefins.

4225. (original): The mixture of claim 4209, wherein the condensable hydrocarbons further comprise olefins, and wherein about 0.1 % to about 2.5 % by weight of the condensable hydrocarbons comprises olefins.

4226. (currently amended): The mixture of claim 4209, wherein the non-condensable ~~hydrocarbons component~~ further ~~comprise~~ comprises H<sub>2</sub>, and wherein greater than about 5 % by weight of the non-condensable component ~~mixture~~ comprises H<sub>2</sub>.

4227. (currently amended): The mixture of claim 4209, wherein the non-condensable ~~hydrocarbons component~~ further ~~comprise~~ comprises H<sub>2</sub>, and wherein greater than about 15 % by weight of the non-condensable component ~~mixture~~ comprises H<sub>2</sub>.

4228. (currently amended): The mixture of claim 4209, wherein a weight ratio of hydrocarbons having greater than about 2 carbon atoms, ~~to methane,~~ to methane is greater than about 0.3.

4229. (currently amended): A mixture produced from a ~~portion of~~ a hydrocarbon containing formation, ~~the mixture comprising:~~

a non-condensable component ~~hydrocarbons~~ comprising hydrocarbons having carbon numbers of less than 5, wherein a weight ratio of hydrocarbons having carbon numbers from 2 through 4, ~~to methane,~~ to methane is greater than approximately 1;

condensable hydrocarbons;  
wherein less than about 1 % by weight, when calculated on an atomic basis, of the condensable hydrocarbons comprises nitrogen;  
wherein less than about 1 % by weight, when calculated on an atomic basis, of the condensable hydrocarbons comprises oxygen; and  
wherein less than about 1 % by weight, when calculated on an atomic basis, of the condensable hydrocarbons comprises sulfur.

4230. (currently amended): The mixture of claim 4229, further comprising ammonia, wherein greater than about 0.05 % by weight of the ~~produced~~ mixture is ammonia.

4231. (original): The mixture of claim 4229, wherein less than about 5 weight % of the condensable hydrocarbons have a carbon number greater than approximately 25.

4232. (original): The mixture of claim 4229, wherein the condensable hydrocarbons comprise olefins, and wherein about 0.1 % by weight to about 15 % by weight of the condensable hydrocarbons are olefins.

4233. (currently amended): The mixture of claim 4229, wherein a molar ratio of ethene to ethane in the non-condensable ~~hydrocarbons~~ component ranges from about 0.001 to about 0.15.

4234. (original): The mixture of claim 4229, wherein about 5 % by weight to about 30 % by weight of the condensable hydrocarbons comprise oxygen containing compounds, and wherein the oxygen containing compounds comprise phenols.

4235. (original): The mixture of claim 4229, wherein greater than about 20 % by weight of the condensable hydrocarbons are aromatic compounds.

4236. (original): The mixture of claim 4229, wherein less than about 5 % by weight of the condensable hydrocarbons comprises multi-ring aromatics with more than two rings.

4237. (original): The mixture of claim 4229, wherein less than about 0.3 % by weight of the condensable hydrocarbons are asphaltenes.

4238. (original): The mixture of claim 4229, wherein about 5 % by weight to about 30 % by weight of the condensable hydrocarbons are cycloalkanes.

4239. (currently amended): The mixture of claim 4229, wherein the non-condensable ~~hydrocarbons component~~ comprises molecular hydrogen, and wherein the molecular hydrogen is greater than about 10 % by volume of the non-condensable ~~hydrocarbons component~~ at 25 °C and one atmosphere absolute pressure, and wherein the molecular hydrogen is less than about 80 % by volume of the non-condensable ~~hydrocarbons component~~ at 25 °C and one atmosphere absolute pressure.

4240. (currently amended): The mixture of claim 4229, further comprising ammonia, and wherein greater than about 0.05 % by weight of the ~~produced~~ mixture is ammonia.

4241. (original): The mixture of claim 4229, further comprising ammonia, and wherein the ammonia is used to produce fertilizer.

4242. (currently amended): The mixture of claim 4229, wherein the condensable hydrocarbons ~~comprises-comprise~~ oxygenated hydrocarbons, and wherein greater than about 5 % by weight of the condensable ~~component-hydrocarbons~~ comprises-comprise oxygenated hydrocarbons.

4243. (currently amended): The mixture of claim 4229, wherein the non-condensable ~~hydrocarbons-comprise~~ component comprises H<sub>2</sub>, and wherein greater than about 5 % by weight of the non-condensable ~~hydrocarbons-component~~ comprises H<sub>2</sub>.



4244. (currently amended): The mixture of claim 4229, wherein the non-condensable ~~hydrocarbons comprise~~component comprises  $H_2$ , and wherein greater than about 15 % by weight of the ~~mixture~~non-condensable component comprises  $H_2$ .

4245. (currently amended): The mixture of claim 4229, wherein a weight ratio of hydrocarbons having greater than about 2 carbon atoms, ~~to methane, is greater,~~ to methane is greater than about 0.3.

4246. (currently amended): A mixture produced from ~~a portion of~~ a hydrocarbon containing formation, ~~the mixture~~ comprising:

a non-condensable hydrocarbons component comprising hydrocarbons having carbon numbers of less than 5, wherein a weight ratio of hydrocarbons having carbon numbers from 2 through 4, ~~to methane,~~ to methane is greater than approximately 1;

ammonia, wherein greater than about 0.5 % by weight of the mixture comprises ammonia; and

condensable hydrocarbons comprising oxygenated hydrocarbons, wherein greater than about 5 % by weight of the condensable hydrocarbons comprises oxygenated hydrocarbons.

4247. (original): The mixture of claim 4246, wherein the condensable hydrocarbons further comprise olefins, and wherein about 0.1 % by weight to about 15 % by weight of the condensable hydrocarbons are olefins.

4248. (currently amended): The mixture of claim 4246, wherein the non-condensable ~~hydrocarbons further comprise~~component comprises ethene and ethane, and wherein a molar ratio of ethene to ethane in the non-condensable ~~hydrocarbons~~component ranges from about 0.001 to about 0.15.

4249. (previously presented): The mixture of claim 4246, wherein the condensable hydrocarbons further comprise nitrogen containing compounds, and wherein less than about 1 % by weight, when calculated on an atomic basis, of the condensable hydrocarbons is nitrogen.

4250. (previously presented): The mixture of claim 4246, wherein the condensable hydrocarbons further comprise oxygen containing compounds, and wherein less than about 1 % by weight, when calculated on an atomic basis, of the condensable hydrocarbons is oxygen.

4251. (previously presented): The mixture of claim 4246, wherein the condensable hydrocarbons further comprise sulfur containing compounds, and wherein less than about 1 % by weight, when calculated on an atomic basis, of the condensable hydrocarbons is sulfur.

4252. (original): The mixture of claim 4246, wherein the condensable hydrocarbons further comprise oxygen containing compounds, wherein about 5 % by weight to about 30 % by weight of the condensable hydrocarbons comprise oxygen containing compounds, and wherein the oxygen containing compounds comprise phenols.

4253. (original): The mixture of claim 4246, wherein the condensable hydrocarbons further comprise aromatic compounds, and wherein greater than about 20 % by weight of the condensable hydrocarbons are aromatic compounds.

4254. (original): The mixture of claim 4246, wherein the condensable hydrocarbons further comprise multi-aromatic rings, and wherein less than about 5 % by weight of the condensable hydrocarbons comprises multi-ring aromatics with more than two rings.

4255. (original): The mixture of claim 4246, wherein the condensable hydrocarbons further comprise asphaltenes, and wherein less than about 0.3 % by weight of the condensable hydrocarbons are asphaltenes.

4256. (original): The mixture of claim 4246, wherein the condensable hydrocarbons further comprise cycloalkanes, and wherein about 5 % by weight to about 30 % by weight of the condensable hydrocarbons are cycloalkanes.

4257. (currently amended): The mixture of claim 4246, wherein the non-condensable ~~hydrocarbons further comprise hydrogen~~component comprises molecular hydrogen, wherein the molecular hydrogen is greater than about 10 % by volume of the non-condensable ~~hydrocarbons~~component at 25 °C and one atmosphere absolute pressure, and wherein the molecular hydrogen is less than about 80 % by volume of the non-condensable ~~hydrocarbons~~component at 25 °C and one atmosphere absolute pressure.

4258. (original): The mixture of claim 4246, wherein the produced mixture further comprises ammonia, and wherein greater than about 0.05 % by weight of the produced mixture is ammonia.

4259. (original): The mixture of claim 4246, wherein the produced mixture further comprises ammonia, and wherein the ammonia is used to produce fertilizer.

4260. (original): The mixture of claim 4246, wherein the condensable hydrocarbons comprise hydrocarbons having a carbon number of greater than approximately 25, and wherein less than about 15 weight % of the hydrocarbons in the mixture have a carbon number greater than approximately 25.

4261. (currently amended): The mixture of claim 4246, wherein the non-condensable ~~hydrocarbons further comprise~~component comprises H<sub>2</sub>, and wherein greater than about 5 % by weight of the ~~mixture non-condensable component~~component comprises H<sub>2</sub>.

4262. (currently amended): The mixture of claim 4246, wherein the non-condensable ~~hydrocarbons further comprise~~component comprises H<sub>2</sub>, and wherein greater than about 15 % by weight of the ~~mixture non-condensable component~~component comprises H<sub>2</sub>.

4263. (currently amended): The mixture of claim 4246, wherein the non-condensable ~~hydrocarbons further comprise~~component comprises hydrocarbons having carbon numbers of greater than 2, and wherein a weight ratio of hydrocarbons having carbon numbers greater than 2; ~~to methane, to methane~~ is greater than about 0.3.

4264. (currently amended): A mixture produced from a ~~portion of~~ a hydrocarbon containing formation, ~~the mixture comprising:~~

a non-condensable hydrocarbons component comprising hydrocarbons having carbon numbers of less than 5, wherein a weight ratio of hydrocarbons having carbon numbers from 2 through 4, ~~to methane, to methane~~ is greater than approximately 1; and

condensable hydrocarbons comprising olefins, wherein less than about 10 % by weight of the condensable hydrocarbons comprises olefins.

4265. (currently amended): The mixture of claim 4264, wherein the non-condensable ~~hydrocarbons further comprise component~~ comprises ethene and ethane, and wherein a molar ratio of ethene to ethane in the non-condensable ~~component~~ hydrocarbons ranges from about 0.001 to about 0.15.

4266. (previously presented): The mixture of claim 4264, wherein the condensable hydrocarbons further comprise nitrogen containing compounds, and wherein less than about 1 % by weight, when calculated on an atomic basis, of the condensable hydrocarbons is nitrogen.

4267. (previously presented): The mixture of claim 4264, wherein the condensable hydrocarbons further comprise oxygen containing compounds, and wherein less than about 1 % by weight, when calculated on an atomic basis, of the condensable hydrocarbons is oxygen.

4268. (previously presented): The mixture of claim 4264, wherein the condensable hydrocarbons further comprise sulfur containing compounds, and wherein less than about 1 % by weight, when calculated on an atomic basis, of the condensable hydrocarbons is sulfur.

4269. (original): The mixture of claim 4264, wherein the condensable hydrocarbons further comprise oxygen containing compounds, wherein about 5 % by weight to about 30 % by weight of the condensable hydrocarbons comprise oxygen containing compounds, and wherein the oxygen containing compounds comprise phenols.

4270. (original): The mixture of claim 4264, wherein the condensable hydrocarbons further comprise aromatic compounds, and wherein greater than about 20 % by weight of the condensable hydrocarbons are aromatic compounds.

4271. (original): The mixture of claim 4264, wherein the condensable hydrocarbons further comprise multi-ring aromatics, and wherein less than about 5 % by weight of the condensable hydrocarbons comprises multi-ring aromatics with more than two rings.

4272. (original): The mixture of claim 4264, wherein the condensable hydrocarbons further comprise asphaltenes, and wherein less than about 0.3 % by weight of the condensable hydrocarbons are asphaltenes.

4273. (original): The mixture of claim 4264, wherein the condensable hydrocarbons further comprise cycloalkanes, and wherein about 5 % by weight to about 30 % by weight of the condensable hydrocarbons are cycloalkanes.

4274. (currently amended): The mixture of claim 4264, wherein the non-condensable ~~hydrocarbons further comprise~~ component comprises molecular hydrogen, and wherein the molecular hydrogen is greater than about 10 % by volume of the non-condensable ~~hydrocarbons~~ component at 25 °C and one atmosphere absolute pressure, and wherein the molecular hydrogen is less than about 80 % by volume of the non-condensable ~~hydrocarbons~~ component at 25 °C and one atmosphere absolute pressure.

4275. (currently amended): The mixture of claim 4264, wherein the ~~produced~~ mixture further comprises ammonia, and wherein greater than about 0.05 % by weight of the ~~produced~~ mixture is ammonia.

4276. (currently amended): The mixture of claim 4264, wherein the ~~produced~~ mixture further comprises ammonia, and wherein the ammonia is used to produce fertilizer.

4277. (currently amended): The mixture of claim 4264, wherein the condensable hydrocarbons further comprise hydrocarbons having a carbon number of greater than approximately 25, and wherein less than about 15 % by weight of the condensable hydrocarbons have a carbon number greater than approximately 25.

4278. (original): The mixture of claim 4264, wherein about 0.1 % to about 5 % by weight of the condensable ~~component~~ hydrocarbons comprises olefins.

4279. (original): The mixture of claim 4264, wherein about 0.1% to about 2 % by weight of the condensable ~~component~~ hydrocarbons comprises olefins.

4280. (original): The mixture of claim 4264, wherein the condensable hydrocarbons further comprise oxygenated hydrocarbons, and wherein greater than about 5 % by weight of the condensable hydrocarbons comprises oxygenated hydrocarbons.

4281. (original): The mixture of claim 4264, wherein the condensable hydrocarbons further comprise oxygenated hydrocarbons, and wherein greater than about 25 % by weight of the condensable ~~component~~ hydrocarbons comprises oxygenated hydrocarbons.

4282. (currently amended): The mixture of claim 4264, wherein the non-condensable ~~hydrocarbons further comprise~~ component comprises H<sub>2</sub>, and wherein greater than about 5 % by weight of the non-condensable ~~hydrocarbons~~ component comprises H<sub>2</sub>.

4283. (currently amended): The mixture of claim 4264, wherein the non-condensable ~~hydrocarbons further comprise~~ component comprises H<sub>2</sub>, and wherein greater than about 15 % by weight of the non-condensable ~~hydrocarbons~~ component comprises H<sub>2</sub>.

4284. (currently amended): The mixture of claim 4264, wherein a weight ratio of hydrocarbons having greater than about 2 carbon atoms, ~~to methane,~~ to methane is greater than about 0.3.

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